



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

August 2, 2011

EA-11-160

Mr. Paul Harden  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
P. O. Box 4, Route 168  
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION - NRC INTEGRATED INSPECTION  
REPORT 05000334/2011003 AND 05000412/2011003, AND EXERCISE OF  
ENFORCEMENT DISCRETION

Dear Mr. Harden:

On June 30, 2011, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Beaver Valley Power Station Units 1 and 2. The enclosed integrated inspection report documents the inspection results, which were discussed on July 21, 2011, with members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, this report documents one (1) NRC-identified finding (Green) and one (1) self-revealing finding of very low safety significance (Green). One finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program (CAP), the NRC is treating this as a non-cited violation (NCV), consistent with Section 2.3.2 of the NRC's Enforcement Policy.


If you contest any of the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Beaver Valley. In addition, if you disagree with the characterization of the cross-cutting aspect of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 1 and the NRC Senior Resident Inspector at the Beaver Valley Power Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

Additionally, the inspectors reviewed Licensee Event Report 50-412/2011-001, which described the details associated with defective diesel generator fuel injection pump supply lines resulting in the Train 'A' Emergency Diesel Generator (EDG) being declared inoperable. This issue constituted a violation of NRC requirements, in that FENOC operated with both EDGs inoperable without immediately taking actions to restore an EDG to operable status in

accordance with Technical Specifications (TS). However, the NRC concluded that the cause of the inoperability, incorrectly assembled compression fittings on replacement fuel injection pump supply lines, was due to an inadequate vendor design change and therefore, did not represent a performance deficiency on the licensee's part. The NRC noted that FENOC took immediate action to ensure availability of at least one EDG, declared the EDG inoperable in a timely manner, and effectively implemented the TS required action statement to immediately initiate action to restore operability. The NRC's risk evaluation determined the issue to be of very low safety significance. Based on these facts, I have been authorized, after consultation with the Director, Office of Enforcement, and the Regional Administrator, to exercise enforcement discretion in accordance with the NRC Enforcement Policy and refrain from issuing enforcement for the violation.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). We appreciate your cooperation. Please contact me at 610-337-5200 if you have any questions regarding this letter.

Sincerely,

  
Darrell J. Roberts, Director  
Division of Reactor Projects

Docket Nos.: 50-334, 50-412  
License Nos: DPR-66, NPF-73

Enclosures: Inspection Report 05000334/2011003; 05000412/2011003  
w/ Attachment: Supplemental Information

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accordance with Technical Specifications (TS). However, the NRC concluded that the cause of the inoperability, incorrectly assembled compression fittings on replacement fuel injection pump supply lines, was due to an inadequate vendor design change and therefore, did not represent a performance deficiency on the licensee's part. The NRC noted that FENOC took immediate action to ensure availability of at least one EDG, declared the EDG inoperable in a timely manner, and effectively implemented the TS required action statement to immediately initiate action to restore operability. The NRC's risk evaluation determined the issue to be of very low safety significance. Based on these facts, I have been authorized, after consultation with the Director, Office of Enforcement, and the Regional Administrator, to exercise enforcement discretion in accordance with Section 3.5 of the Enforcement Policy and refrain from issuing enforcement for the violation.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). We appreciate your cooperation. Please contact me at 610-337-5200 if you have any questions regarding this letter.

Sincerely,  
**/RA by James W. Clifford Acting For/**  
 Darrell J. Roberts, Director  
 Division of Reactor Projects

Docket Nos.: 50-334, 50-412  
 License Nos: DPR-66, NPF-73

Enclosures: Inspection Report 05000334/2011003; 05000412/2011003  
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**U. S. NUCLEAR REGULATORY COMMISSION****REGION I**

Docket Nos. 50-334, 50-412

License Nos. DPR-66, NPF-73

Report Nos. 05000334/2011003 and 05000412/2011003

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Shippingport, PA 15077

Dates: April 1, 2011 through June 30, 2011

Inspectors: D. Werkheiser, Senior Resident Inspector  
E. Bonney, Resident Inspector  
C. Crisden, Emergency Preparedness Specialist  
T. Moslak, Health Physicist  
T. Ziev, Reactor Engineer

Approved by: R. Bellamy, Ph.D., Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000334/2011003, IR 05000412/2011003; 04/01/2011 – 06/30/2011; Beaver Valley Power Station, Units 1 & 2; Heat Sink, Performance and Problem Identification and Resolution.

The report covered a 3-month period of inspection by two resident inspectors, a regional emergency preparedness inspector, a regional reactor inspector, and a regional health physics inspector. Two (Green) findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated February 2010. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### Cornerstones: Mitigating Systems & Barrier Integrity

- Green. A Green, self-revealing non-cited violation (NCV) of TS 5.4.1, "Procedures", was identified in that the Unit 2 Recirculation Spray System (RSS) Heat Exchangers (HXs) were not maintained in chemical wet layup, contrary to station procedures and industry guidance. Specifically, FENOC failed to maintain place corrosion inhibitors in the RSS HXs, resulting in significant HX corrosion, which led to degraded flow through the B RSS HX during a service water full flow test. This issue was entered into the licensee's corrective action program under CR 11-90430.

Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The inspectors determined that the finding was not similar to the examples for minor deficiencies contained in IMC 0612, Appendix E, "Examples of Minor Issues". The finding is more than minor because it affects the Mitigating Systems and Barrier Integrity cornerstones. The finding is associated with the equipment performance attribute of the Mitigating Systems cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is also associated with the Structure Systems and Components (SSC) and barrier performance attribute of the Barrier Integrity cornerstone to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system and containment) protect the public from radionuclide releases caused by accidents or events.

In accordance with IMC 0609.04 (Table 4a), "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the finding did not result in a loss of operability, nor was it a degradation of a radiological barrier, control room barrier, hydrogen igniter, or an open pathway.

The cause of this NCV relates to the cross-cutting aspect of Human Performance, Work Control, in that FENOC personnel did not coordinate work activities consistent with nuclear safety. Specifically, FENOC did not coordinate work activities to complete the chemical wet layup condition to support long-term equipment reliability of the Unit 2 RSS HXs. [H.3(b)] (Section 1R07)

### Cornerstone: Public Radiation Safety

- Green. A Green, NRC-identified finding (FIN) was identified in that plans and actions to correct long-standing radiation monitor system instrument deficiencies were not accomplished in a timely manner, in accordance with FENOC CAP procedure NOP-LP-2001. Specifically, FENOC failed to correct and return to service radiation monitor instruments for Unit 1 and 2 RSS HX [RM-1RW-100A,B,C,D and 2SWS-RQ100A,B,C,D], in a timely manner, requiring maintenance of alternate monitoring and challenges to assessing radiation detection and assessment during accident situations. This issue was entered into the licensee's corrective action program under CR(s) 11-91673 and 11-89700.

Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The inspectors determined that the finding was not similar to the examples for minor deficiencies contained in IMC 0612, Appendix E, "Examples of Minor Issues". The finding is more than minor because it affects the Public Radiation Safety cornerstone. The finding is associated with the attribute of plant equipment and instrumentation (process radiation monitors) attribute of the Public Radiation Safety cornerstone to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation.

In accordance with IMC 0609.04 (Table 3a), "Phase 1 – Initial Screening and Characterization of Findings," the finding was evaluated using IMC 0609 Appendix D, "Public Radiation Safety Significance Determination Process" and determined to be of very low safety significance (Green) because the finding was not a failure to implement the effluent program or cause any public dose to be exceeded.

The cause of this NCV relates to the cross-cutting aspect of Problem, Identification, and resolution, Corrective Action Program, in that FENOC personnel did not take timely corrective actions to develop and implement actions for long-standing radiation monitor deficiencies. [P.1(d)] (Section 4OA2.3)

## REPORT DETAILS

### Summary of Plant Status:

Unit 1 began the inspection period at 100 percent power. On April 7, the unit was down-powered to 82 percent for planned waterbox cleaning, then commenced a planned shutdown for replacement of a power range nuclear instrument (NI-42). The unit commenced a startup on April 16, and returned to full power on April 21. The unit remained at 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period shut down in a refueling outage. On April 8, the unit commenced a start-up. On April 10, the unit reached 18% reactor power and performed a required shutdown in response to an AFW system leak, prior to synchronization. The unit restarted on April 10, and returned to full power on April 14. The unit was down-powered to 94 percent on April 26 for a reheater drain control valve repair and returned to full power on April 27. The unit remained at 100 percent power for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity [R]**

#### 1R01 Adverse Weather Protection (71111.01)

##### a. Inspection Scope (2 samples: hot weather and power system readiness)

##### Seasonal Susceptibility

The inspectors reviewed the Beaver Valley Power Station (BVPS) design features and FENOC's implementation of procedures to protect risk significant mitigating systems from adverse weather effects due to summer weather. The inspectors reviewed the corrective action program database, operating experience, and the Updated Final Safety Analysis Report (UFSAR), to determine the types of adverse weather conditions to which the site is susceptible, and to verify that the licensee was appropriately identifying and resolving weather-related equipment problems.

##### Offsite & Alternate AC Power System Readiness

The inspectors evaluated BVPS design features and FENOC's implementation of procedures to address issues that could impact offsite alternating current (AC) power systems. The inspectors reviewed FENOC's procedures and programs which discussed the operation and availability/reliability of offsite and alternate AC power systems during adverse weather. The inspectors verified that communication protocols between the transmission system operator and FENOC existed, and the appropriate information would be conveyed when potential grid stress and disturbances existed. The inspectors also verified that FENOC's procedures contained actions to monitor and maintain the availability/reliability of offsite and on-site power systems prior to and during adverse weather conditions.

##### b. Findings

No findings were identified.

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1R04 Equipment Alignment (71111.04).1 Partial System Walkdowns (71111.04Q)a. Inspection Scope (3 samples)

The inspectors performed three partial equipment alignment inspections during conditions of increased safety significance, including when redundant equipment was unavailable during maintenance or adverse conditions. The partial alignment inspections were also completed after equipment was recently returned to service after significant maintenance. The inspectors performed partial walkdowns of the following systems, including associated electrical distribution components and control room panels, to verify the equipment was aligned to perform its intended safety functions:

- Unit 2, April 25, 'A' train component cooling water (CCW) during 'B' CCW heat exchanger cleaning;
- Unit 2, June 22, temporary air compressor system line-up during 'B' station air compressor maintenance; and
- Unit 1, June 24, 1-2 emergency diesel generator (EDG) fuel oil transfer pump (FOTP) system during 1-1 EDG fuel oil transfer pump (FOTP) testing.

b. Findings

No findings were identified.

.2 Complete System Walkdown (71111.04S)a. Inspection Scope (1 sample)

The inspectors completed a detailed review of the alignment and condition of the Unit 2 'A' train low head safety injection (LHSI) system. The inspectors conducted a walkdown of the system to verify that the critical portions, such as valve positions, switches, and breakers, were correctly aligned in accordance with procedures, and to identify any discrepancies that may have had an effect on operability.

The inspectors also reviewed outstanding maintenance work orders to verify that the deficiencies did not significantly affect the LHSI system function. In addition, the inspectors discussed system health with the system engineer and reviewed the condition report database to verify that equipment alignment problems were being identified and appropriately resolved. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05).1 Quarterly Sample Review (71111.05Q)a. Inspection Scope (5 samples)

The inspectors reviewed the conditions of the fire areas listed below, to verify compliance with criteria delineated in Administrative Procedure 1/2-ADM-1900, "Fire Protection," Rev. 23. This review included FENOC's control of transient combustibles and ignition sources, material condition of fire protection equipment including fire detection systems, water-based fire suppression systems, gaseous fire suppression systems, manual firefighting equipment and capability, passive fire protection features, and the adequacy of compensatory measures for any fire protection impairments. Documents reviewed are listed in the Attachment:

- Unit 1, Auxiliary Building General Area (Fire Area PA-1A);
- Unit 2, Cooling Tower Pump House (Fire Area CTP-1);
- Unit 2, Auxiliary Boiler Area (Fire Area SOB-1);
- Unit 2, South Office Shops Building Railway Bay (Fire Area SOB-2); and
- Unit 2, South Office Shops Building (Fire Area SOB-3).

b. Findings

No findings were identified.

.2 Annual Fire Drill Observation (71111.05A)a. Inspection Scope (1 sample)

The inspectors observed personnel performance during a fire drill involving a simulated fire at the Unit 1 'B' System Station Service Transformer (SSST) on April 19, to evaluate the readiness of station personnel to prevent and fight fires. The inspectors observed the fire brigade members using protective clothing, turnout gear, and self-contained breathing apparatus and entering the fire area in a controlled manner. The inspectors also observed the fire fighting equipment brought to the fire scene to evaluate whether sufficient equipment was available to effectively control and extinguish the simulated fire. The inspectors evaluated whether the permanent plant fire hose lines were capable of reaching the fire area and whether hose usage was adequately simulated. The inspectors observed the fire fighting directions and communications between fire brigade members. The inspectors verified that the pre-planned drill scenario was followed and observed the post drill critique to evaluate if the drill objectives were satisfied and that any drill weaknesses were discussed.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)a. Inspection Scope (1 sample)

The inspectors reviewed a sample of internal flood protection measures for equipment in the common intake structure 'D' cubicle containing safety-related service water equipment for Unit 2.

This review was conducted to evaluate FENOC's protection of the enclosed safety-related systems from internal flooding condition. The inspectors performed a walkdown of the area, reviewed the UFSAR, related internal flooding evaluations, and other related documents. The inspectors examined the as-found equipment and conditions to ensure that they remained consistent with those indicated in the design basis documentation, flooding mitigation documents, and risk analysis assumptions. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07).1 Annual Sample Review (71111.07A)a. Inspection Scope (1 sample)

The inspectors reviewed the maintenance associated with the Unit 2 'B' train RSS HX conducted in March and April 2011, in accordance with 2CMP-13RSS-E-21A-B-C-D-1M, "Recirculation Spray Heat Exchanger Maintenance," Rev. 7. The review included an assessment of the testing methodology and verified consistency with Electric Power Research Institute document NP-7552, "Heat Exchanger Performance Monitoring Guidelines," December 1991, and Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment." The inspectors reviewed maintenance results, related condition reports and 'B' RSS Service Water System full flow test results against applicable acceptance criteria.

b. Findings

Introduction: A Green, self-revealing non-cited violation (NCV) of TS 5.4.1, "Procedures", was identified in that the Unit 2 RSS Heat Exchangers HXs were not maintained in chemical wet layup, contrary to station procedures. Specifically, FENOC failed to maintain corrosion inhibitors in the RSS HXs, resulting in significant HX corrosion, which led to degraded flow through the 'B' RSS HX during a service water full flow test.

Description: On February 24, during a 'B' train service water (SW) full flow test, Unit 2 discovered degraded flow through the 'B' RSS HX. The as-found SW flow through the 'B' RSS HX during the full flow test was 3650 gpm, which resulted in a failed surveillance test. The required SW flow rate through the 'B' RSS HX was 5731 gpm per 2OST-30.13.13B, "Train 'B' Service Water System Full Flow Test". On March 4th, the 'B' RSS HX was removed from service for inspection and cleaning. The inspection identified a

significant amount of corrosion products blocking flow in the lower end bell of the vertically-mounted heat exchanger. The corrosion products were removed from the end bell and hydrolazing was performed on the SW piping during the 2R15 outage in April to restore system function.

The RSS HXs were originally placed in wet layup in November of 2008. Procedure 2OM-30.4.T, "Placing Recirc Spray HXs into Chemical Wet Layup", established that corrosion inhibitors are required to maintain RSS HXs in wet layup. A maintenance review of the four RSS HXs determined that corrosion inhibitors were last added to the 'B' and 'D' RSS HXs in November 2008, and the 'A' and 'C' RSS HXs were last placed in wet layup in October 2009, per 2OM-30.4.T.

EPRI NP-7552, "Heat Exchanger Performance Monitoring Guidelines," allows use of the periodic maintenance method to comply with heat exchanger testing methodology. Water treatment is one of three periodic maintenance methods used by FENOC to ensure adequate RSS HX performance. EPRI NP-7552 states that "improper water treatment can result in accelerated corrosion, resulting in component reliability concerns." The work management process was not utilized to establish a periodic chemical test and addition to maintain the proper wet layup chemical profile. Sampling of the RSS HXs was not performed to ensure the correct chemical concentration existed to ensure the selected maintenance method was effective. FENOC subsequently generated recurring work orders 200450991 and 200450994 to correct the issue and ensure all four RSS HXs are maintained in the proper chemical wet layup condition.

Analysis: The failure to maintain the RSS HXs in chemical wet layup is considered a performance deficiency. Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The inspectors determined that the finding was not similar to the examples for minor deficiencies contained in IMC 0612, Appendix E, "Examples of Minor Issues". The finding is more than minor because it affects the Mitigating Systems and Barrier Integrity cornerstones. The finding is associated with the equipment performance attribute of the Mitigating Systems cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is also associated with the SSC and barrier performance attribute of the Barrier Integrity cornerstone to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system and containment) protect the public from radionuclide releases caused by accidents or events.

In accordance with IMC 0609.04 (Table 4a), Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the finding did not result in a loss of operability nor was it a degradation of a radiological barrier, control room barrier, hydrogen igniter, or an open pathway.

The cause of this NCV relates to the cross-cutting aspect of Human Performance, Work Control, in that FENOC personnel did not coordinate work activities consistent with nuclear safety. Specifically, FENOC did not coordinate work activities to complete the chemical wet layup condition to support long-term equipment reliability of the Unit 2 RSS HXs. [H.3(b)]

**Enforcement:** TS 5.4.1, "Procedures", requires that procedures be established, implemented, and maintained as recommended in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33, Section 10 requires, in part, chemical and radiological control procedures to maintain water quality within prescribed limits and the limitations on concentrations of agents that may cause corrosive attack or fouling of heat-transfer surfaces. Contrary to the above, FENOC failed to maintain the RSS HXs in chemical wet layup in accordance with station procedures and EPRI NP-7552, which resulted in significant fouling of the B RSS HX. Because this deficiency is considered to be of very low safety significance (Green), and was entered into the corrective action program (CR 11-90430), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000412/2011003-1, Failure to Maintain Recirculation Spray Heat Exchangers in Chemical Wet Layup)**

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope (1 sample)

The inspectors observed one sample of Unit 1 licensed operator simulator training and drill on June 29. The inspectors evaluated licensed operator performance regarding command and control, implementation of normal, annunciator response, abnormal, and emergency operating procedures, communications, technical specification review and compliance, and emergency plan implementation. The inspectors evaluated the licensee staff training personnel to verify that deficiencies in operator performance were identified, and that conditions adverse to quality were entered into the licensee's corrective action program for resolution. The inspectors reviewed simulator physical fidelity to assure the simulator appropriately modeled the plant control room. The inspectors verified that the training evaluators adequately addressed that the applicable training objectives had been achieved.

b. Findings

No findings were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope (3 samples)

The inspectors evaluated Maintenance Rule (MR) implementation. The inspectors evaluated specific attributes, such as MR scoping, characterization of failed structures, systems, and components (SSCs), MR risk characterization of SSCs, SSC performance criteria and goals, and appropriateness of corrective actions. The inspectors verified that the issues were addressed as required by 10 CFR 50.65 and the licensee's program for MR implementation. For the selected SSCs, the inspectors evaluated whether performance was properly dispositioned for MR category (a)(1) and (a)(2) performance monitoring. MR System Basis Documents were also reviewed. Documents reviewed are listed in the Attachment.

- On April 2, Unit 2, 'A' train solid state protection system 48 volt power supply failure, documented in CR 11-92245;

- On April 25, Unit 1 and 2, maintenance rule program health "Equipment Performance" yellow cornerstone, documented in CR 11-92375; and
- On April 27, Unit 2, emergency diesel generator maintenance rule (a)(1) evaluation due to goal failure, documented in CR 11-93593.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessment and Emergent Work Control (71111.13)

a. Inspection Scope (4 samples)

The inspectors reviewed the scheduling and control of four activities, and evaluated their effect on overall plant risk. This review was conducted to ensure compliance with applicable criteria contained in 10 CFR 50.65(a)(4). Documents reviewed during the inspection are listed in the Attachment.

- On April 14, Unit 1, planned entry into yellow risk for transformer breaker work;
- On April 15, Unit 2, risk evaluation for chemical addition to 'A' and 'C' RSS HXs per WO 200451815;
- On May 24, Unit 1, planned maintenance during 'A' intake structure bay outage; and
- On May 26-27, Unit 2, PRA review for turbine-driven auxiliary feedwater pinhole steam leak repairs.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (6 samples)

The inspectors evaluated the technical adequacy of selected immediate operability determinations (IOD), prompt operability determinations (POD), or functionality assessments (FA), to verify that determinations of operability were justified. In addition, the inspectors verified that technical specification (TS) limiting conditions for operation (LCO) requirements and UFSAR design basis requirements were properly addressed. In addition, the inspectors reviewed compensatory measures implemented to ensure the measures worked and were adequately controlled. Documents reviewed are listed in the Attachment.

- On March 31, Unit 2, pressurizer safety valve [2RCS-RV551C] gasket evaluation and acceptability as documented in CR 11-92159;
- On April 4, Unit 1 evaluation of river water piping below nominal thickness as documented in CR 11-92133;
- On May 3, Unit 2, stroke time for 'B' atmospheric dump valve outside acceptance range as documented in CR 11-94053;
- On May 9, Unit 1, 'B' quench spray pump [1QS-P-1B] comprehensive test acceptance criteria not meet evaluation as documented in CR 11-94414;

- On June 8, Unit 1, IOD regarding net positive suction for fuel oil transfer for emergency diesel generators as documented in CR 11-96157; and
- On June 22, Units 1 and 2, licensee 10CFR21 evaluation regarding the MOV/AOV Kalsi Engineering Valve and Actuator Program software.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope (2 samples)

The inspectors reviewed the following permanent and temporary modifications based on risk significance. The permanent modifications and associated 10 CFR 50.59 screenings were reviewed against the system design basis documentation, including the UFSAR and the TS. The inspectors verified that attributes and parameters within the design documentation were consistent with required licensing and design bases, as well as credited codes and standards, and walked down the systems to verify that changes described in the package were appropriately implemented. The inspectors verified the temporary modifications were implemented in accordance with Administrative (ADM) Procedure, 1/2-ADM-2028, "Temporary Modifications," Rev. 6. The inspectors also verified the post-modification testing was satisfactorily accomplished to ensure the system and components operated consistent with their intended safety function. Documents reviewed are listed in the Attachment.

- On March 26, Unit 2 ECP 09-0771 extension, to maintain a packing follower retainer on 2SWS-184; and
- On April 4, Unit 2 ECP-11-0179, disabling of BV-DC-SWBD 2-1 alarm.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (7 samples)

The inspectors reviewed the following activities to determine whether the post-maintenance tests (PMT) adequately demonstrated that the safety-related function of the equipment was satisfied given the scope of the work, and that operability of the system was restored. In addition, the inspectors evaluated the applicable acceptance criteria to verify consistency with the design and licensing bases, as well as TS requirements. The inspectors witnessed the test or reviewed test data to verify results adequately demonstrated restoration of affected safety functions. The inspectors also verified that conditions adverse to quality were entered into the corrective action program for resolution. Documents reviewed during the inspection are listed in the Attachment.

- On March 25, Unit 2, WO 200450628 after rebuild of loop fill header relief valve [2CHS-160];

- On April 3, Unit 2, WO 200451094 'B' RSS HX retesting after lower-end cleaning;
- On April 6, Unit 2, WO 200452432 2SWS-MOV-155-2 testing after maintenance;
- On April 10, Unit 2, non-destructive examination and pressure test after weld repairs to 2FWE-940 connection per WO 2011-006;
- On April 15, Unit 1, WO 200451486 Power Range Nuclear Instrument (PRNI) N42 testing and performance after detector replacement during outage 1POAC4;
- On April 17, Unit 1 adjustment of PRNI N42 trip set points post-detector replacement; and
- On May 5, Unit 1 'C' charging pump seal replacement and vent valve installation.

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities (71111.20) (2 samples total)

.1 Unit 2 Refueling Outage (2R15)

a. Inspection Scope (1 sample)

The inspectors observed selected outage activities to determine whether shutdown safety functions (e.g. reactor decay heat removal, spent fuel pool cooling, and containment integrity) were properly maintained as required by TS and plant procedures. The inspectors evaluated specific performance attributes including operator performance, communications, and instrumentation accuracy. The inspectors reviewed procedures and/or observed selected activities associated with the Unit 2 refueling outage. The inspectors verified activities were performed in accordance with procedures and verified required acceptance criteria were met. The inspectors also verified that conditions adverse to quality identified during performance of selected outage activities were identified as required by the licensee's corrective action program. Documents reviewed are listed in the Attachment. The inspectors also evaluated the:

- Final containment walkdown and closeout inspection;
- Reactor start-ups (April 8 and April 10) and heat-up;
- Balance of plant walkdown during power ascension.

The inspectors also observed selected management review activities associated with restart readiness of Unit 2, following completion of the 2R15 refueling activities. The restart readiness review meeting was accomplished as required by NOBP-OM-4010, "Restart Readiness for Plant Outages," Rev. 4, on March 30. The purpose of the review, in part, was to assure that the plant's material condition, programs/processes, and personnel were ready for startup and safe, reliable operation after completion of outage activities.

The inspectors observed the reactor trip and shutdown on April 10 (return to Mode 3) in response to an AFW header leak as described in NRC Event Notification 46744 (see Section 4OA3.1). Inspectors also observed the subsequent reactor start up and power ascension following the repair to the AFW header later in the evening on April 10.



b. Findings

No findings were identified.

.2 Unit 1 Maintenance Outage (1POAC4)a. Inspection Scope (1 sample)

The inspectors reviewed licensee performance during a planned maintenance outage following a Unit 1 shutdown on April 10, to replace the failed Power Range Nuclear Instrument (PRNI-42) detector and to address other plant related issues. The inspectors reviewed compliance to TS requirements and approved procedures, conduct of outage risk evaluations, configuration control, and maintenance of key safety functions. Documents reviewed during the inspection are listed in the Attachment. During this maintenance outage, the inspectors monitored FENOC's control of the outage activities listed below:

- Reactor Shutdown and Shutdown risk evaluation
- Startup Readiness Review (April 15) and Scheduling
- Reactor Startup (April 15) and Criticality (April 16)
- Plant Startup
- Power Ascension

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)a. Inspection Scope (6 samples: 1 isolation valve, 1 leak rate, 1 in-service testing and 3 routine)

The inspectors witnessed the performance of or reviewed test data for the eight following Operation Surveillance Test (OST) and Maintenance Surveillance (MSP) packages. The reviews verified that the equipment or systems were being tested as required by TS, the UFSAR, and procedural requirements. The inspectors also verified that the licensee established proper test conditions, that no equipment pre-conditioning activities occurred, and that acceptance criteria were met.

- On April 2, Unit 2, 2BVT-1.47.11, SI and Charging System Containment Penetration Valve Integrity Test;
- On April 6, Unit 2, 2OST-30.13B, Train B Service Water System Full Flow Test;
- On April 10, Unit 1, 1OST-6.2A, Computer Generated Reactor Cooling System Water Balance Inventory;
- On April 11, Unit 2, 2OST-24.9, Overspeed Trip Test of Turbine Driven AFW;
- On April 12, Unit 1, 1RST-3.4, Incore Analysis of Quadrant Power Tilt Ratio; and
- On May 26, Unit 2, 2OST-24.4, Steam Driven Auxiliary Feed Pump [2FWE\*P22] Quarterly Test.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness [EP]**

1EP2 Alert and Notification System (ANS) Evaluation (71114.02)

a. Inspection Scope (1 sample)

An onsite review was conducted to assess the maintenance and testing practices of the Beaver Valley ANS. During the inspection, the inspectors reviewed the ANS maintenance and testing procedure, maintenance and test records, and the Federal Emergency Management Agency (FEMA) approved design report to ensure FENOC compliance with design report commitments for system maintenance and testing. A sample of condition reports (CRs) pertaining to the ANS was reviewed for causes, trends, and corrective actions. The inspectors interviewed FENOC corporate staff to discuss system performance and upgrades. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 2. Planning Standard, 10 CFR 50.47(b)(5) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization (ERO) Staffing and Augmentation System (71114.03)

a. Inspection Scope (1 sample)

The inspectors conducted a review of Beaver Valley's ERO augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to ensure the readiness of key licensee staff to respond to an emergency event and to ensure FENOC's ability to activate their emergency response facilities in a timely manner. The inspectors reviewed the Beaver Valley Emergency Plan, duty roster, and augmentation data. The inspectors also reviewed a sampling of ERO responder's training records to ensure training and qualifications were up to date. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 3. Planning Standard, 10 CFR 50.47(b)(2) and related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

**1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04)****a. Inspection Scope (1 sample)**

Since the last NRC inspection of this program area in April 2010, FENOC implemented various revisions to the Beaver Valley Emergency Plan. FENOC had determined that, in accordance with 10 CFR 50.54(q), these changes made to the Plan, and its lower-tier implementing procedures, had not resulted in any decrease in effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. Although no emergency action level (EAL) changes were reviewed during this inspection, a sample of emergency plan changes, including the changes to lower-tier emergency plan implementing procedures, was evaluated for any potential decreases in effectiveness of the Beaver Valley Emergency Plan. However, this review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

**b. Findings**

No findings were identified.

**1EP5 Correction of Emergency Preparedness Weaknesses (71114.05)****a. Inspection Scope (1 sample)**

The inspectors reviewed a sampling of self-assessment procedures and reports to assess FENOC's ability to evaluate their emergency preparedness (EP) performance and program. The inspectors reviewed a sampling of CRs from September 2009 through May 2011 initiated by FENOC from drills, self-assessments, and audits. The inspectors also reviewed 10 CFR 50.54(t) audit reports and nuclear oversight audits. This inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 5, Planning Standard, 10 CFR 50.47(b)(14) and the related requirements of 10 CFR 50, Appendix E, were used as reference criteria.

**b. Findings**

No findings were identified.

**1EP6 Drill Evaluation (71114.06)****a. Inspection Scope (1 sample)**

The inspectors observed an emergency preparedness Red Team mini-drill and Unit 1 licensed-operator simulator evaluation during a drill on June 29. Senior licensed-operator performance regarding event classifications and notifications was specifically evaluated. The inspectors evaluated the simulator-based scenario that involved multiple, safety-related component failures and plant conditions that would have warranted emergency plan activation, emergency facility activation, and escalation to the event classification of Site Area Emergency. FENOC planned to credit this evolution toward Emergency Preparedness Drill/Exercise Performance (DEP) Indicators,

therefore, the inspectors reviewed the applicable event notifications and classifications to determine whether they were appropriately credited, and properly evaluated consistent with Nuclear Energy Institute (NEI) 99-02, Rev. 6, "Regulatory Assessment Performance Indicator Guideline." The inspectors reviewed licensee evaluator worksheets regarding the performance indicator acceptability, and reviewed other crew and operator evaluations to ensure adverse conditions were appropriately entered into the Corrective Action Program. Other documents utilized in this inspection include the following:

- 1/2-ADM-1111, Rev. 4, "NRC EPP Performance Indicator Instructions;"
- 1/2-ADM-1111.F01, Rev. 3, "Emergency Preparedness Performance Indicators Classifications/Notifications/PARS;"
- EPP-I-1a/b, Rev. 14, "Recognition and Classification of Emergency Conditions;"
- 1/2-EPP-I-2, Rev. 35, "Unusual Event;"
- 1/2-EPP-I-3, Rev. 33, "Alert;"
- 1/2-EPP-I-4, Rev. 33, "Site Area Emergency;" and
- 1/2-EPP-I-5, Rev. 34, "General Emergency."

b. Findings

No findings were identified.

## 2. **RADIATION SAFETY**

### **Cornerstone: Public Radiation Safety [PS]**

#### 2RS05 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope (1 sample)

During the period June 20 - 23, the inspector conducted activities to evaluate the operability and accuracy of radiation monitoring instrumentation used to detect and quantify effluent releases. Implementation of these programs was reviewed against the criteria contained in 10 CFR Part 20, applicable industry standards, and the licensee's procedures.

#### Walkdown of Effluent Monitoring Systems

The inspector walked down selected portions of the liquid and gaseous monitoring systems installed in Unit 1 and Unit 2 to assess material condition and determine the status of system upgrades.

In Unit 1, the walkdown included portions of the following monitors:

#### Gaseous Effluent Monitors:

- Gaseous Waste Monitor, RM-1GW-108
- Fuel Handling Building Exhaust, RM-1VS-103 A/B
- Ventilation Vent Exhaust Monitor, RM-1GW-1VS-101
- Elevated Release Monitor, RM-1VS-107
- Auxiliary Building Exhaust Monitor, RM-1VS-109

- Reactor Building Supplemental Leak Collection and Release System (SCLRS) Monitor, RM-1VS-110
- Auxiliary Building Exhaust Monitor, RM-1VS-111
- Reactor Building SCLRS Noble Gas Monitor, RM-1-VS-112

Liquid Effluent Monitors:

- Liquid Waste Effluent Monitor, RM-1LW-104
- Contaminated Drains Effluent Monitor, RM-1LW-116
- Component Cooling Water Monitor, RM-1RW-101

In Unit 2, the walkdown included portions of the following monitors:

Gaseous Effluent Monitors:

- Ventilation Vent Monitor, 2HVS-RQ101
- Supplemental Leak Collection and Release System (SCLRS) Monitor, 2HVS-RQ109

Liquid Effluent Monitors:

- Liquid Waste Effluent Monitor, 2SGC-RQ100

Calibration and Testing Program

Through record reviews, the inspector confirmed that the effluent monitoring instruments were properly calibrated, and that the required source checks and functional tests had been routinely performed. The inspector verified that the effluent monitor alarm set points are established in accordance with the Offsite Dose Calculation Manual (ODCM).

The inspector reviewed contamination sampling results (per 10 CFR Part 61) used to characterize difficult-to-measure radioisotopes, to determine if the calibration sources were representative of the radioisotopes found in the plant's source term.

Problem Identification and Resolution

The inspector reviewed selected Condition Reports (CRs), system health reports, and various Nuclear Oversight reports to evaluate the licensee's threshold for identifying, evaluating, and resolving problems for the radiation monitoring instrumentation. Included in this review were CRs related to radiation worker and radiation protection technician errors to determine if an observable pattern traceable in the maintenance or use of radiation instruments was evident.

b. Findings

See finding in section 4OA2.3

## 2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

### a. Inspection Scope (1 sample)

During the period June 20 - 23, the inspector conducted activities to verify FENOC was properly maintaining the gaseous and liquid effluent processing systems to ensure that radiological releases were properly mitigated, monitored, and evaluated with respect to public exposure. Implementation of these controls was reviewed against the criteria contained in the 10 CFR Parts 20 and 50, the licensee's ODCM, and the licensee's procedures.

### Effluent Report Reviews

The inspector reviewed the 2009 and 2010 Annual Radiological Effluent Release Reports to verify that the effluents program was implemented as required by the ODCM. Included in this review were the results of the ground water protection program, the inclusion of Carbon-14 dose contributions, the current land use census, and verification that no significant changes were made to the Unit 1 and Unit 2 gaseous and liquid release system configurations, as specified in the Final Safety Analysis Report (FSAR) and ODCM descriptions.

### Walkdowns and Observations

The inspector walked down the major components of the Unit 1 and Unit 2 gaseous and liquid release systems to verify the system configurations complied with the FSAR description, to evaluate equipment material condition, and determine the status of system upgrades.

The inspector reviewed the most current Unit 1 and Unit 2 liquid and gaseous effluent monitor monthly source checks, quarterly functional test results and 18-month calibration records to verify that instrumentation and associated pumps/isolation valves or fans/isolation dampers, respectively, were operable.

The inspector reviewed the air cleaning systems surveillance test results for the High Efficiency Particulate Absolute (HEPA) and charcoal filtration systems installed in Unit 1 and Unit 2. The inspector confirmed that the air flow rates were consistent with the FSAR values and the filtration system test results met the acceptance criteria.

### Sampling and Analysis

The inspector reviewed the relevant sampling/analytical procedures and observed a technician collect a weekly air sample from the Unit 2 Decontamination Building ventilation system (2RMQ-RQ301B) and analyze the sample on a gamma spectrophotometer. The inspector confirmed that the technician complied with the procedural requirements in taking the gas sample and the sample was appropriately analyzed.

The inspector reviewed the daily quality control checks performed on laboratory counting instruments to verify the system had the required accuracy. The inspector also reviewed the results of the licensee's inter-laboratory comparison and cross check (blind sample)

programs to verify that the accuracy of other detectors used for counting effluent samples were operating reliably.

The inspector confirmed that procedures have been established and alternative sampling equipment is readily available for use, if normal effluent monitors become unavailable.

#### Dose Calculations

The inspector reviewed monthly, quarterly, and annual dose projections for liquid and gaseous effluents performed during the past 12 months to verify that effluent was processed and released in accordance with ODCM requirements and to ensure that FENOC licensee properly calculated the offsite dose from effluent releases. The inspector confirmed that no performance indicator (criteria contained in Appendix I to 10 CFR Part 50) was exceeded for these releases.

The inspector observed a technician prepare a liquid discharge permit (No. 5823) for releasing the steam generator condensates tank (2SGC-TK23B). The inspector reviewed other liquid discharge permits for Unit 1 and Unit 2 to evaluate the adequacy of dilution flow, radioactive content, set point adjustment on liquid waste monitor 2SGC-RQ100, and overall accuracy of the documented data.

#### Ground Water Protection Program

The inspector verified that FENOC is continuing to implement the voluntary NEI/Industry Ground Water Protection Initiative. The inspector reviewed monitoring well sample results, trending data, and decommissioning records, maintained per 10 CFR 50.75 (g), to evaluate procedural compliance and to identify off normal results.

#### b. Findings

No findings were identified.

### 4. **OTHER ACTIVITIES [OA]**

#### 4OA1 Performance Indicator Verification (71151)

##### a. Inspection Scope (9 samples total)

The inspectors sampled licensee submittals for Performance Indicators (PI) listed below for both Unit 1 and Unit 2 to verify accuracy of the data recorded from July 2010 through June 2011. The inspectors reviewed Licensee Event Reports, condition reports, portions of various plant operating logs and reports, and PI data developed from monthly operating reports. Methods for compiling and reporting the PIs were discussed with cognizant engineering and licensing personnel. To verify the accuracy of the PI data reported during this period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 6, were used for each data element.

Cornerstone: Mitigating Systems (2 samples)

- Unit 1 and Unit 2 Safety System Functional Failure [MS05];

Cornerstone: Barrier Integrity (4 samples)

- Unit 1 and Unit 2 Reactor Coolant System Activity [BI01]
- Unit 1 and Unit 2 Reactor Coolant System Leak Rate [BI02]

Cornerstone: Emergency Preparedness (3 samples)

The inspectors reviewed data for EP PIs, which are:

- Drill and Exercise Performance;
- ERO Drill Participation; and
- ANS Reliability.

The inspectors reviewed the PI data and its supporting documentation from the second quarter of 2010 through the first quarter of 2011 to verify the accuracy of the reported data.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples total).1 Daily Review of Problem Identification and Resolutiona. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into FENOC's corrective action program. This review was accomplished by reviewing summary lists of each CR, attending screening meetings, and accessing FENOC's computerized CR database.

b. Findings

No findings were identified.

.2 Annual Sample: Station Work Management Implementation Reviewa. Inspection Scope (1 sample)

The inspectors reviewed a selected number of CRs related to the implementation of work management at the station and focused on issues related to the completion of surveillance tests documented CR 11-89576 and 11-91287 as a problem identification and resolution (PI&R) sample for a detailed follow-up review.



The inspectors reviewed FENOC's full apparent cause and monitored the corrective action review board assessment for CR 11-89576. The inspectors reviewed cause determination and assessed FENOC's extent of condition, operability determination, and prioritization and timeliness of corrective actions to prevent recurrence. Documents reviewed for this inspection are located in the Attachment.

b. Findings and Observations

No findings were identified.

In general, FENOC has identified trends in work management and has appropriately addressed the trends within their CAP and actions taken by the work management group to communicate and provide guidance to the station. FENOC continues to focus on improvements to and effectiveness of the work management implementation. The inspectors have recently observed challenges in completing work activities due to insufficient staff resources, particularly instrumentation and controls staff, during outages at other fleet stations. FENOC plans to review their resource-sharing plans to minimize this impact. The inspectors will continue to monitor this area and assess the effectiveness of planned and in-progress corrective actions.

.3 Annual Sample: Station Radiation Monitor Corrective Action Review

a. Inspection Scope (1 sample)

The inspectors reviewed a selected number of CRs related to issues and deficiencies regarding various radiation monitors that are important to safe operation and used in emergency response assessments. Specifically, the inspectors focused on corrective actions for the Unit 1 and 2 RSS HX monitors [RM-1RW-100A, B, C, D and 2SWS-RQ100A, B, C, D], however other actions for other monitors related to FENOC's prompt function assessment (CR 10-86918 and 09-68196) were reviewed as a problem identification and resolution (PI&R) sample for a detailed follow-up review.

The inspectors reviewed FENOC's prompt functions assessment, control room radiation monitor logs, action plans, and completed corrective actions for the selected monitors. The inspectors reviewed cause determination and assessed FENOC's extent of condition, prioritization, and timeliness of corrective actions. Documents reviewed for this inspection are located in the Attachment.

b. Findings and Observations

One finding was identified. The inspectors also observed a significant number of out-of-service radiation monitors documented in the radiation monitor track logs in the control room for both Unit 1 and Unit 2. These monitors were accounted for by FENOC in their prompt function assessments (CR 10-86918 and 09-68196), however a number of corrective actions are still outstanding and have been extended. Also, a number of these out-of-service monitors were not required for safe operation.

Introduction: A Green, NRC-identified finding (FIN) was identified in that plans and actions to correct long-standing radiation monitor system instrument deficiencies were not accomplished in a timely manner, in accordance with FENOC CAP procedure NOP-LP-2001. Specifically, FENOC failed to correct and return to service radiation monitor

instruments for Unit 1 and 2 RSS HX [RM-1RW-100A,B,C,D and 2SWS-RQ100A,B,C,D], in a timely manner, requiring maintenance of alternate monitoring and challenges to assessing radiation detection and assessment during accident situations. This issue was entered into the licensee's corrective action program under CR(s) 11-91673 and 11-89700.

Discussion: A review of FENOC's prompt function assessments revealed that Unit 1 and Unit 2 RSS HX radiation monitors have been out of service since September 2007 and 2006, respectively, due to failing to meet minimum UFSAR river and service water flow requirements during surveillance testing. The low flow is due to the susceptibility of the sample lines to clog with debris and mud. These issues were originally documented in CRs 06-00509, 07-05648, and 09-68196. Further inspector review identified this condition has been observed on Unit 1 since 2003.

Alternate methods for detection (alternate monitors) and methods for estimating releases (i.e. 1/2-EPP-IP-2.7, Liquid Release Estimate) were identified and implemented. Engineering changes were developed and implemented in an attempt to correct the low flow issue and return the monitors to service. The recovery of these monitors require multiple groups to coordinate and complete corrective actions.

These issues have been long-standing with multiple corrective actions that have been extended and delayed due to design, parts, resource, and scheduling issues. The monitors have not yet been returned to service. FENOC has reevaluated and modified their recovery plans and has made measureable progress towards completing the ECPs affecting the recovery of the RSS HX monitors.

Analysis: Traditional enforcement does not apply because the issue did not have an actual safety consequence or the potential for impacting NRC's regulatory function, and was not the result of any willful violation of NRC requirements. The inspectors determined that the finding was not similar to the examples for minor deficiencies contained in IMC 0612, Appendix E, "Examples of Minor Issues". The finding is more than minor because it affects the Public Radiation Safety cornerstone. The finding is associated with the attribute of plant equipment and instrumentation (process radiation monitors) attribute of the Public Radiation Safety cornerstone to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation.

In accordance with IMC 0609.04 (Table 3a), "Phase 1 – Initial Screening and Characterization of Findings," the finding was evaluated using IMC 0609 Appendix D, "Public Radiation Safety Significance Determination Process" and determined to be of very low safety significance (Green) because the finding was not a failure to implement the effluent program or cause any public dose to be exceeded.

The cause of this NCV relates to the cross-cutting aspect of Problem, Identification, and resolution, Corrective Action Program, in that FENOC personnel did not take timely corrective actions to develop and implement actions for long-standing radiation monitor deficiencies. [P.1 (d)]

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. FENOC has revised and refocused their radiation monitor action plan and continues to take action to return the

Unit 1 and 2 RSS HX monitors to service, as documented in CRs CR 10-86918, 09-68196, 11-91673, and 11-89700. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as finding (FIN) 05000334, 412/2011003-02, **Untimely Radiation Monitor Corrective Actions.**

4OA3 Followup of Events and Notices of Enforcement Discretion (71153 - 2 samples total)

The inspectors performed one event followup inspection activity. Documents reviewed for this inspection activity are listed in the Supplemental Information attached to this report.

.1 Plant Event Review

a. Inspection Scope (1 sample)

For the plant event below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant event to regional personnel and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of additional reactive inspection activities. The inspectors reviewed FENOC's follow-up actions related to the events to assure that appropriate corrective actions were implemented commensurate with their safety significance. Documents reviewed during the inspection are listed in the Attachment.

- Unit 2: On April 10, control room operators initiated a manual reactor trip while performing TS required shutdown due to reaching the pre-established trip criteria for low water level (25%) on the 'A' steam generator water level. The TS required shutdown was in response to an observed weld leak at 2FWE-940, an auxiliary feedwater header line. This weld leak did not affect steam generator water levels. After the manual reactor trip, water level continued to lower due to shrink and reached 20.5% level, and caused an automatic actuation of the steam driven auxiliary feedwater pump. Operators quickly recovered and stabilized steam generator water levels. This event was reported to the NRC via Event Notification #467744 and was directly observed by the resident inspectors. Operators responded appropriately and mitigating systems performed as designed. The licensee documented this issue in CR 11-92597 and 11-92603 and is conducting a root cause evaluation. This issue was also reviewed under NRC OpESS FY2009-02, "Negative Trend and Recurring Events Involving Feedwater Systems."

b. Findings

No findings were identified.

.2 Review of Licensee Event Reports (LERs) (1 sample)

(Closed) LER 50-412/2011-001, "Defective Fuel Injection Pump Supply Lines Provided by the Diesel Engine Manufacturer Results in an Emergency Diesel Generator Being Inoperable"

On March 25, while Beaver Valley, Unit 2 was shut down in Mode 6 (refueling), scheduled maintenance was performed on the Train 'A' EDG which included replacing

the twelve fuel injection pump supply lines with new fuel injection pump supply lines procured from the EDG vendor. During post maintenance testing of the Train 'A' EDG, the supply line to the number four injector was replaced with its original supply line due to a small fuel leak (approximately 6 drops per minute). Several additional fuel supply line fittings were tightened to eliminate signs of minor leakage and the required post maintenance testing and endurance run of the Train 'A' EDG was completed satisfactorily. After successful post maintenance testing, the Train 'A' EDG was declared operable by the licensee and the Train 'B' EDG was subsequently declared inoperable and removed from service for routine maintenance.

Approximately 11 hours later the vendor informed the licensee of its recommendation to remove all of the new fuel injection pump supply lines previously installed on the Train 'A' EDG due to concerns over the adequacy of the assembly method of the fuel line compression fittings. Based on this vendor recommendation, the licensee immediately declared Train 'A' EDG inoperable. Since both EDG trains were inoperable for approximately 11 hours, during which time no action was immediately taken to restore one to operability as required by TS 3.8.2.B, the licensee was inadvertently in a condition prohibited by TS. When the licensee determined that both EDG trains were inoperable, they entered TS 3.8.2.B, initiated actions to restore one EDG to operable status, and evaluated the issue for reportability and appropriately issued LER 50-412/2011-001, "Defective Fuel Injection Pump Supply Lines Provided by the Diesel Engine Manufacturer Results in an Emergency Diesel Generator Being Inoperable," dated May 19, 2011. This LER reported that Beaver Valley, Unit 2 had been in a condition that was prohibited by TS 3.8.2.B, which requires immediate action if both trains of EDG are inoperable while in Mode 6 operations.

The issue was considered within the traditional enforcement process because there was no performance deficiency identified and Inspection Manual Chapter (IMC) 0612, Appendix B, "Issue Screening" directs disposition of this issue in accordance with the Enforcement Policy. The inspectors used the Enforcement Policy, Section 6.1 – Reactor Operations, to evaluate the significance of this violation. The inspectors concluded that the violation is more than minor and best characterized as Severity Level IV (very low safety significance) because it is similar to Enforcement Policy Section 6.1, example d.1. Additionally, the inspectors assessed the risk associated with the issue by using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process." The inspectors screened the issue, and evaluated it using Checklist 4 of IMC 0609, Appendix G, Attachment 1. The inspectors also reviewed the licensee's risk evaluation of the event. Based on these reviews, this issue would screen as very low safety significance (Green).

Because it was not reasonable for the licensee to either have declared the Train 'A' EDG inoperable at an earlier time or to have foreseen the inadequate assembly of the fuel injection pump supply line fittings, the NRC determined no performance deficiency existed. Thus, the NRC has decided to exercise enforcement discretion in accordance with the Enforcement Policy and refrain from issuing enforcement action for the violation. (EA-11-160). Further, because licensee actions did not contribute to this violation, it will not be considered in the assessment process or the NRC's Action Matrix. This LER is closed.

4OA5 Other.1 Institute of Nuclear Power Operations (INPO) Report Reviewa. Inspection Scope

The inspectors reviewed the final report (dated April 19<sup>th</sup>, 2011) for the INPO plant assessment of Beaver Valley conducted in February 2011 on May 17<sup>th</sup>, 2011. The inspectors also reviewed the final report for the INPO accreditation team evaluation of the maintenance, chemistry, and radiological protection technical training programs conducted February 2011. The inspectors reviewed these reports to ensure that any issues identified were consistent with NRC perspectives of FENOC performance and to determine if INPO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

.2 (Closed) NRC Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

The inspectors assessed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as required by 10 CFR 50.54(hh); (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63 and station design bases; (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site.

Inspection Report 05000334/412-2011008 (ML111310328) documented detailed results of this inspection activity.

.3 (Closed) NRC Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"

On May 18, 2011, the inspectors completed a review of the licensee's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the SAMGs were available and updated, (2) whether the licensee had procedures and processes in place to control and update its SAMGs, (3) the nature and extent of the licensee's training of personnel on the use of SAMGs, and (4) licensee personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for

agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for Beaver Valley Power Station were provided in an Attachment to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated May 27, 2011 (ML111470361).

#### 4OA6 Management Meetings

- .1 2010 Annual Assessment Discussion  
On April 28, Ronald Bellamy, NRC Branch Chief for Beaver Valley, discussed Beaver Valley performance for 2010 with Mr. P. Harden, Site Vice President, prior to the public annual assessment meeting.
- .2 USNRC Commissioner Magwood visit to Beaver Valley Power Station  
On May 10, Commissioner Magwood, accompanied by his staff and Mr. J. Clifford, NRC Region I Deputy Director of Reactor Projects, toured Beaver Valley Power Station and discussed station performance with Mr. P. Harden, Site Vice President, and other senior members of FENOC.
- .3 Radiation Monitoring Instrumentation and Protective Equipment  
On May 20, an exit meeting was conducted with Mr. R. Brosi, Director of Performance Improvement, and other members of the Beaver Valley staff to discuss the results and observations of the inspection.
- .4 Emergency Preparedness  
On May 20, an exit meeting was conducted with Mr. R. Brosi, Director of Performance Improvement, and other members of the Beaver Valley staff to discuss the results and observations of the inspection.
- .5 Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"  
On June 3, an exit meeting was conducted with Mr. R. Lieb, Director of Site Operations to discuss the results of the TI.
- .6 Radioactive Gaseous and Liquid Effluent Treatment  
On June 23, an exit meeting was conducted with Mr. P. Harden, Site Vice President, and other members of the Beaver Valley staff to discuss the results and observations of the Radioactive Effluent inspection.
- .7 Quarterly Inspection Report Exit  
On July 21, the inspectors presented the normal baseline inspection results to Mr. D. Murray, Director of Performance Improvement, and other members of the licensee staff. The inspectors confirmed that proprietary information was not retained at the conclusion of the inspection period.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

**SUPPLEMENTAL INFORMATION****KEY POINTS OF CONTACT**Licensee personnel

M. Banko	Chemistry Supervisor
R. Brosi	Director, Performance Improvement
S. Buffington	Design Engineer
G. Cacciani	Design Analysis Engineer
D. Canan	Radiation Protection Specialist
W. Cress	Supervisor, Chemistry Laboratory
G. Cramer	Emergency Response Manager
D. Eckleberry	Senior Radiation Protection Technician
R. Fedin	Staff Nuclear Specialist, Emergency Preparedness
J. Gallagher	Staff Nuclear Engineer
D. Gibson	Operations Supervisor
P. Harden	Site Vice President
M. Helms	Fleet Oversight Specialist
R. Lieb	Director, Site Operations
J. Matsko	Plant Engineering Manager
J. Mauck	Compliance Engineer
C. McFeaters	Operations Manager
D. Murray	Director Performance Improvement
A. Oduho	System Radiation Monitor Engineer
L. Renz	Environmental Specialist
J. Saunders	Radiation Protection Supervisor
F. Schaffner	Staff Nuclear Specialist, Emergency Preparedness
B. Sepelak	Supervisor, Regulatory Compliance
H. Szklinski	Staff Nuclear Specialist, Emergency Preparedness
R. Thompson	Senior Chemistry Technician
B. Tuite	Manager Regulatory Compliance

Other Personnel

L. Ryan	Inspector, Pennsylvania Department of Radiation Protection
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**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Open/Closed

05000412/2011003-01	NCV	Failure to Maintain Recirculation Spray Heat Exchangers in Chemical Wet Layup. (Section 1R07)
05000334, 412/2011003-02	FIN	Failure to timely correct Radiation Monitor deficiencies. (Section 4OA2.3)

Closed

05000412/2011001-00	LER	Defective Fuel Injection Pump Supply Lines Provided by the Diesel Engine Manufacturer Results in an Emergency Diesel Generator Being Inoperable. (Section 4OA3.2)
05000334, 412/2515/183	TI	Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event. (Section 4OA5.2)
05000334, 412/2515/184	TI	Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs). (Section 4OA5.3)



## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures

1/2OM-35.4A.A, Voltage Schedule Guidance, Rev. 6

1/2OM-53C.4A.35.1, Degraded Grid, Rev. 7

NOP-WM-2001, Work Management Scheduling/Assessment/Seasonal Readiness Process,  
Rev. 11

#### Conditions Reports

11-88241      10-81176      10-81175      10-76445      08-42553      08-35334

### **Section 1R04: Equipment Alignment**

#### Procedures

2OM-15.3.B.1, Valve List-2CCP, Rev. 16

2OM-11.3.B.1, Valve List-2SIS, Rev. 12

#### Drawings

VOND 10800-RM-0415-001

VOND 10080-RM-0411-001

#### Condition Reports

11-92336      11-94045

### **Section 1R05: Fire Protection**

#### Procedures

1/2 ADM-1900      1/2 ADM-1902

#### Pre-Fire Plans

1PFP-AXLB-768      2PFP-CTP1

#### Calculation

10080-B-085, Rev. 14

#### Condition Reports

11-92600      11-95411      11-94375      11-91730      07-31091

### **Section 1R06: Flood Protection**

#### Calculations

8700-DMC-3443, Rev. 2

#### Condition Reports

11-92449

Other  
 BVPS-2 UFSAR  
 BVPS Unit 2 Probabilistic Risk Assessment  
 2DBD-30

### **Section 1R07: Heat Sink Performance**

#### Procedures

2OM-30.4.T, Placing Recirc Spray Hxs into Chemical Wet Layup, Rev.0  
 2OST-30.13B, Train B Service Water System Full Flow Test, Rev. 28  
 2-CHM-ADD-7.50, Recirculating Spray Heat Exchanger Chemical Cleaning, Rev. 0

#### Condition Reports

11-90096	11-90430	11-92189	11-91787	11-90643	11-92570
11-90899	11-90901	11-90787	11-90986	11-91018	11-91026
11-91513	11-92251	11-92644	11-92269	02-00350	02-00277

#### Other

NOTF 600464500      WO200451815      WO20040991      WO200450994

### **Section 1R11: Licensed Operator Requalification Program**

Red Team Mini-Drill Scenario, Rev. 0

### **Section 1R12: Maintenance Rule Implementation**

#### Procedures

NOP-ER-3004, FENOC Maintenance Rule Program, Rev. 1  
 NOP-ER-2101, Engineering Program Management, Rev. 3  
 NOBP-LP-4012, NRC Performance Indicators, Rev. 3

#### Other

Maintenance Rule Quarterly Program Health Report 2011-1  
 WO 200452790  
 NOTF 600673949

#### Condition Reports

11-92375	11-92245	11-88460	07-31282
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### **Section 1R13: Maintenance Risk Assessment and Emergent Work Control**

#### Procedures

1/2 ADM-2033

#### Condition Reports

11-92841	11-91436	11-90721
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#### Other

BV Unit 1 Weekly Maintenance Risk Summary for the week of April 11, 2011, Rev. 1  
 BV Unit 1 Weekly Maintenance Risk Summary for the week of May 23, 2011, Revs. 1, 2, and 3,

Attachment

**Section 1R15: Operability Evaluations**Procedures

1OST-13.02, 'B' Quench Spray pump surveillance test  
 2OST-47.3M, Quarter Valve Strokes  
 2OST-30.13B, Train 'B' Service Water System Full Flow Test, Rev. 28

Condition Reports

11-89270      11-94426

Drawings

2006.510-001-025, Rev D, Crosby safety valve assembly

Calculations

8700-DMC-3395, Rev. 0

Other

2SVS-PCV101B stroke-time history  
 BV1 Shift Operations Logs dated May 9, 2011  
 Clearance 1W09-13-QS-003

**Section 1R18: Plant Modifications**Condition Reports

11-91800

Regulatory Applicability Determination and 10 CFR 50.59 Screens

ECP 11-0179-000  
 ECP 09-0771  
 EER 600672192

Other

NOTF 600672192  
 ECP 11-0179-000

**Section 1R19: Post-Maintenance Testing**Procedures

1/2 CMP-1-2-002, PR Neutron Flux Detector Replacement and Post Installation Tests, Rev. 3  
 1-CMP-1-02-003  
 1 CMP-2N1-OVRPWR.SP1  
 1RST-2.10, Alignment of Power Range Instrumentation for Startup after Mid-cycle detector replacement, Rev. 0  
 1/2-MI-75-Packing-1M, Valve Packing Instruction, Rev. 10  
 1/2-CMP-M-75-039, Repair Rockwell-Edwards Univalves, Rev. 4  
 2OST-30.13B, Train B Service Water System Full Flow Test, Rev. 28  
 BVBP-SITE-0053, Post-Maintenance Test Requirements, Rev. 1

Work Orders

200451486	200432097	200451486	200452432	200452432	200403244
200451094	200450356	200400196	200451265		

Condition Reports

11-92952	11-92170	11-92224	11-91717	11-91905	11-92001
11-90096	11-92251	11-90760			

Other

BetaLab report M11110 for weld crack evaluation for FEW-940 connection, dated April 27, 2011  
 BV2 Shift operations logs dated April 3, 2011  
 ECP 11-005-003

**Section 1R20: Refueling and Outage Activities**Procedures

2MSP-13RS-SUMP, Unit 2 Containment Sump Close-out.

Condition Reports

11-92146	11-92219	11-91659	11-91365
11-92177	11-92238	11-91392	11-91115
11-92229	11-91910	11-91483	
11-92442	11-91883	11-91392	
11-92467	11-91746	11-91390	

Other

1POAC4 Work Project Schedule dated March 30, 2011  
 BV1 Shift Operations logs dated March 16, 20, & 26, 2011  
 BV1 PRNI detector current plots from plant computer, dated March 16, 2011  
 Operational Decision Making Interface for Unit 1 PRNI-42, dated March 26, 2011  
 WO 200399672, QC inspection of Unit 2 containment sump

**Section 1R22: Surveillance Testing**Condition Reports

11-91918	11-92143	11-95443	11-91150
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**Section 1EP2: Alert and Notification System Evaluation**Procedures

1/2-ADM-1107, Alert Notification System (Sirens) Maintenance and Testing, Rev. 11

Other

Beaver Valley Nuclear Facility Design Report, Emergency Warning Notification System,  
 March 1, 1984  
 Supplement to the Beaver Valley Power Station Emergency Warning Notification System  
 Design Report  
 Various Siren and Maintenance Tests, 4<sup>th</sup> quarter 2009 – 1<sup>st</sup> quarter 2011

**Section 1EP3: Emergency Response Organization Staffing and Augmentation System**Procedures

1/2-ADM-1101, Emergency Response Organization Administration, Rev. 11  
 1/2-ADM-1102, BVPS Emergency Notification Testing, Review and Trending, Rev. 2

1/2-EPP-IP-1.7, Emergency Response Organization (ERO) Teams, Rev. 20  
 1/2 OST-57.1, Emergency Beeper Notification System, Rev. 15

Other

Beaver Valley Power Station Emergency Preparedness Plan  
 ERO Roster

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

Procedures

NOP-LP-5002, Evaluation of Changes to Emergency Plans and Supporting Documents  
 10 CFR 50.54(q), Rev. 2  
 NOP-LP-4003, Evaluation of Changes, Test and Experiments, Rev. 6

Change Evaluations

BV-2010-064-00	BV-2010-069-00	BV-2010-006-00	BV-2010-030-00
BV-2010-033-00	BV-2010-029-00	BV-2010-028-00	BV-2010-067-00
BV-2010-044-00	BV-2010-044-00	BV-2010-012-00	BV-2010-039-00
BV-2010-038-00			

**Section 1EP5: Correction of Emergency Preparedness Weaknesses**

Other

BVRM-EP-5003, Equipment Important to Emergency Response, Rev. 2  
 BV-PA-10-01, Beaver Valley Nuclear Fleet Oversight Quarterly Report, 1<sup>st</sup> quarter 2010  
 BV-PA-10-02, Beaver Valley Nuclear Fleet Oversight Quarterly Report, 2<sup>nd</sup> quarter 2010  
 BV-PA-10-03, Beaver Valley Nuclear Fleet Oversight Quarterly Report, 3<sup>rd</sup> quarter 2010  
 MS-C-10-11-24, Fleet Oversight Audit Report, November 12, 2010 through December 15, 2010  
 IP-SA-10-217, Integrated Performance Assessment and trending, 1<sup>st</sup> six months of 2010  
 IP-SA-11-041, Integrated Performance Assessment and trending, 2<sup>nd</sup> six months of 2010  
 IP-SA-11-176, Integrated Performance Assessment and trending, 1<sup>st</sup> quarter 2011  
 SN-SA-10-160, 2010 Beaver Valley Emergency Response Organization Red Team Mini Drill #1  
 MS-C-09-11-24, Fleet Oversight Audit Report, November 11, 2009 through December 16, 2009  
 SN-SA-10-284, Beaver Valley Power station Emergency Response Organization Blue Team  
 during Mini-Drill #3, July 22, 2010  
 SN-SA-10-285, Beaver Valley Power station Emergency Response Organization Green Team  
 during Mini-Drill #4, August 12, 2010

Condition Reports

10-83020	11-94455	09-64018	10-87068	11-87868	10-86883
10-86905	11-94392	10-76036	11-93736	09-69009	09-68905
09-64050	10-82226				

**Sections 2RS05 & 2RS06: Radiation Monitoring Instrumentation & Radioactive Gaseous and Liquid Effluent Treatment**

Procedures:

1/2-ODC-1.01, ODCM: Index, Matrix, and History of ODCM Changes  
 1/2-ODC-2.01, ODCM: Liquid Effluents  
 1/2-ODC-2.02, ODCM: Gaseous Effluents

1/2-ODC-3.01, ODCM: Dispersion Calculation Procedure & Source Term Inputs  
 1/2-ODC-3.02, ODCM: Bases for ODCM Controls  
 1/2-ODC-3.03, ODCM: Controls for RETS and REMP Program  
 1-HPP-4.02.008, SA-9/SA-10 Noble Gas Monitors  
 1/2-HPP-4.02.002, Effluent Monitors  
 1-HPP-4.02.010, SPING-4 Particulate, Iodine, and Noble Gas Monitor  
 2-HPP-4.02.020, DRMS, Process Monitoring Subsystem  
 2-HPP-4.02.021, DRMS, Effluent Monitoring Subsystem  
 1/2-ENV-05.04, Radioactive Waste Discharge Authorization-Liquid  
 1/2-HPP- 3.06.006, Batch Radioactive Waste Discharge Authorization-Gas  
 1/2- ADM-1730, Laboratory Quality Assurance and Instrument Quality Control Program  
 NOP-OP-3202 , FENOC Radiochemistry Quality Control Program  
 NOP-OP-4705, Response to Contaminated Spills/Leaks

In-Plant Effluent Monitors: Calibration/Source/Functional Testing Records Reviewed:

Unit-1:

1MSP-43.61C-I, RM-VS112 Reactor Bldg / SLCRS Radiation Monitor Calibration  
 1MSP-43.18-I, RM-LW104 Liquid Waste Effluent Radiation Monitor Calibration  
 1MSP-43.21-I, RM-1GW-108A Gaseous Waste Particulate Calibration  
 1MSP-43.23I, RM-1LW-116 Channel Functional Test  
 1MSP-43.61C-1, RM-VS-112 Reactor Bldg/SLCRS Monitor Calibration  
 1OST-43.7, Noble Gas Monitors RM-1VS-109/110, 1GW-109 Functional Test  
 1OST-43.9D, RM-1GW-108 Channel Functional Test  
 1OST-43.9F, RM-1LW-104 High Range Channel Functional Test  
 1OST-43.9E, RM-1LW-104 Low Range Channel Functional Test  
 1OST-43.9H, RM-1RW-100 Liquid Effluent Monitor Channel Functional Test  
 1OST-43.9I/J, RM-1VS-101 A/B Gaseous Effluent Monitor Functional Test  
 1OST-43.9K/L, RM-1VS-107 Gaseous Effluent Monitor Functional Test

Unit-2:

2MSP-43.36A-1, 2HVS-RQ101, Ventilation Vent Radiation Monitor Test  
 2MSP-43.33-I, 2HVS-RQ109, B/C/D Elevated Release Gas Monitor Calibration  
 2MSP-43.39-I, 2SGC-RQ100, Liquid Waste Effluent Monitor Calibration  
 2OST-43.2, 2RMF-RQ301A/B, Fuel Building Exhaust Monitor Functional Test  
 2OST-43.3, 2SGC-RQ100, Liquid Waste Effluent Monitor Functional Test  
 2OST-43.5, 2MSS-RQ101 A/B/C Noble Gas Monitor Channel Test  
 2OST-43.9A, 2HVS-RQ101 A/B Ventilation Vent Functional Test  
 2OST-43.8, 2HVS-RQ109C Elevated Release WRGM Functional Test  
 2OST-43.9B, 2RMQ-RQ301 A/B Decon Bldg Effluent Monitor Functional Test  
 2OST-43.9C, 2HVL-RQ112 A/B Condensate Polishing Bldg Effluent RM Test  
 2OST-43.9D, 2RMQ-RQ303 A/B Waste Gas Ventilation Monitor Functional Test

Air Cleaning System Testing:

Unit 1:

BV-1BVT-01-16-06/07, Unit 1 A/B SLCRS HEPA and Charcoal Filter Efficiency and Flow Test  
 BV-1BVT-01-16-08, Unit 1 Main Filter Charcoal Sample – A SLCRS  
 BV-2BVT-01-16-11, Unit 1 Main Filter Charcoal Sample – B SLCRS

Unit 2:

BV-2BVT-01-16-06/07, Unit 2 A/B SLCRS HEPA and Charcoal Filter Efficiency and Flow Test  
 BV-2BVT-01-16-08, Unit 2 Main Filter Charcoal Sample – A SLCRS  
 BV-2BVT-01-16-11, Unit 2 Main Filter Charcoal Sample – B SLCRS

Nuclear Oversight Reports:

Audit MS-C-10-08-02, First Energy Multi-Site Chemistry and Environmental Audit  
 Beaver Valley Fleet Oversight Fourth Quarter 2010 and First Quarter 2011 Reports

Field Observations:

BV320114154      BV220093821      BV320093883      BV320103932

Other Documents:

Monthly, Quarterly, and Annual Liquid & Gaseous Effluent Dose Assessments for Unit 1 and  
 Unit 2 from January 2011 through May 2011  
 2010 Radioactive Effluent Release Report  
 System 43, Radiation Monitoring System; Health Report, 1<sup>st</sup> Quarter 2011  
 50.75 (g) Decommissioning Records  
 RETS Dose Projection for June 2011  
 Unit 1 Boron Recovery/Liquid Waste System Improvement – 50.59 Evaluations  
 Inter-laboratory Comparison Program Results 2010  
 4<sup>th</sup> Quarter 2010 RETS Cross Check Program Results

Condition Reports:

11-96782	11-95363	11-93037	11-92949	11-94121	11-94365
11-95716	11-95774	11-92949	11-95071	11-92214	10-85877
10-83262	09-55238				

**Section 40A1: Performance Indicator Verification**Procedures

1/2 ADM – 1111, NRC EPP Performance Indicator Instructions, Rev. 5

Other

Performance Indicator data – 2<sup>nd</sup> quarter 2010 to 1<sup>st</sup> quarter 2011

**Section 40A2: Identification and Resolution of Problems**Condition Reports

07-05648	09-63257	10-82077	11-93608
07-26618	09-63273	11-89204	11-94038
07-31350	10-71353	11-90598	11-94089
08-38146	11-71984	11-90801	11-94165
09-53803	10-79691	11-90958	11-94167
09-53854	10-80659	11-90962	11-94168
09-60218	10-81046	11-90966	11-95701
09-60782	10-81305	11-91287	
09-60852	10-81680	11-92447	

Procedures

½-ADM-1900, Fire Protection Program  
1OST-30.12A & B, Service Water Full-Flow Test  
1OST-33.10H, 1B Service Station Transformer and ERFs Transformer 3B Deluge Valve Test  
1MSP-1.04, Solid State Protection System Testing, Train 'A'  
NOP-LP-2001, Corrective Action Program  
NOP-WM-4300, Order Execute Process

Work Orders

200436286    200456670    200385515    200449533    200400261

Other

BVPS Maintenance Strategy, Update and Status; 2007,2009, 2010, 2011  
BVPS Radiation Monitor Instrument Action Plan, 2011  
CR11-89576, CARB Package for April 12, 2011  
EPP I-1a, TAB 1.3.4 Containment Bypass  
Event Notification #45296  
ODCM, ½-ODC-3.03  
NUREG-1022  
Surveillance and Periodic Test Program Change for 2MSP-01\_04-I & 2MSP-01\_05-1, dated  
Feb 10, 2009  
Engineering Change Packages 02-0186, 05-0385, 08-650, 09-0131, 09-0132, and 11-0256.

**Section 40A3: Event Response**

Condition Reports

11-95539    11-94109    11-92597    11-92603

Other

BV2 AFW PID, 10080-RM-424.3, Rev. 9  
BV2 steam generator water level plots from plant information computer, dated April 10, 2011  
BV2 shift operations logs, dated April 9 & 10, 2011  
Event notification #46744 dated April 10, 2011  
Event Review Team Package for April 10, 2011 reactor trip, dated April 10, 2011  
Sequence of Events recorder output for BV2 dated April 10, 2011



## LIST OF ACRONYMS

ADM	Administrative Procedure
ANS	Alert and Notification System
BCO	Basis for Continued Operations
BVPS	Beaver Valley Power Station
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report(s)
DEP	Department of Environmental Protection
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
FA	Functionality Assessments
FEMA	Federal Emergency Management Agency
FENOC	First Energy Nuclear Operating Company
FOTP	Fuel Oil Transfer Pump
FSAR	Final Safety Analysis Report
HEPA	High-Efficiency Particulate Air
HX	Heat Exchanger
IMC	Inspection Manual Chapter
IOD	Immediate Operability Determination
IP	Inspection Procedure
ISI	Inservice Inspection
LCO	Limiting Conditions for Operations
LER	Licensee Event Report
LHSI	Low Head Safety Injection
MR	Maintenance Rule
MSP	Maintenance Surveillance Package
NEI	Nuclear Energy Institute
NO	Nuclear Oversight
NRC	Nuclear Regulatory Commission
OD	Operability Determinations
ODCM	Offsite Dose Calculation Manual
OST	Operations Surveillance Test
PI	Performance Indicator
PI&R	Problem Identification and Resolution
POD	Prompt Operability Determination
PMT	Post Maintenance Testing
PRNI	Power Range Nuclear Instrument
RSS	Recirculation Spray System
SAMG	Severe Accident Management Guidelines
SBO	Station Blackout
SLCRS	Supplemental Leak Collection and Release System
SSC	Structures, Systems, and Components
SSST	System Station Service Transformer

A-12

SW  
TS  
UFSAR

Service Water  
Technical Specification  
Updated Final Safety Analysis Report

Attachment